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Indian Standard

SPECIFICATION FOR RUBBER AIR HOSE

(Fourth Revision)

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AMENDMENT NO. 1 MARCH 1995
TO
IS 446 : 1987 SPECIFICATION FOR RUBBER AIR HOSE

(Fourth Revision)

(*Page* 6, *Table* 2) — Substitute the following for the existing table:

TABLE 2 TENSILE STRENGTH AND ELONGATION AT BREAK OF LINING AND COVER

(*Clause* 4.3.1)

SL No. (1)	HOSE TYPE (2)	TENSILE STRENGTH *Min* (3) MPa		ELONGATION AT BREAK, *Min* (4) Percent
i)	1	Lining	4.0	200
		Cover	4.0	200
ii)	2	Lining	5.0	250
		Cover	7.0	250
iii)	3	Lining	7.0	250
		Cover	10.0	300

(PCD 13)

IS : 446 - 1987
(Superseding IS : 911 and IS : 3557)

Indian Standard

SPECIFICATION FOR RUBBER AIR HOSE

(Fourth Revision)

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Indian Standard

SPECIFICATION FOR RUBBER AIR HOSE

(Fourth Revision)

0. FOREWORD

0.1 This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards on 8 September 1987, after the draft finalized by the Rubber Products Sectional Committee, PCDC 13 had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 This standard was first published in 1953 and subsequently revised in 1964, 1968 and 1980. The second revision was amalgamated revision of IS : 446-1964* and IS : 3557-1965† covering both light and heavy duty hose Third revision was amalgamated revision of IS : 446-1968‡ and IS : 911-1986§ covering both the woven and braided constructions.

0.3 In the present revision, specific materials, and design features have not been specified, and only performance requirements have been stipulated to allow for future technological developments Further, the requirements for accelerated ageing, adhesion and elongation at break have been modified and all other changes necessary to align this standard with others in this series of standards on hoses have also been introduced.

0.4 Type 1 and Type 2 hoses are for general purpose while Type 3 for rock drilling purposes.

0.5 This standard contains clauses **4.1.3**, **4.1.4**, **4.2.1** and **7.1** which call for an agreement between the purchaser and the supplier.

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*Specification for air hose of rubber, light duty, with woven reinforcements (*revised*).

†Specification for air hose of rubber heavy duty, with woven reinforcements.

‡Specification for air hose of rubber with woven textile reinforcements (*second revision*).

§Specification for air hose of rubber with braided textile reinforcement (*second revision*).

1. SCOPE

1.1 This standard prescribes the requirements, methods of sampling and test for air hose of rubber suitable for working pressure up to 1·4 MPa*.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in various parts of IS : 7503† shall apply.

3. TYPES

This standard covers following three types of hoses:

Type 1 — for a working pressure of 0·7 MPa,

Type 2 — for a working pressure of 1·0 MPa, and

Type 3 — for a working pressure of 1·4 MPa.

4. REQUIREMENTS

4.1 Construction

4.1.1 *Lining* — A rubber inner lining, smooth in bore.

4.1.2 *Reinforcement* — A reinforcement of natural or synthetic fibres applied by any suitable technique.

4.1.3 *Cover* — A rubber cover.

The lining and cover shall be of uniform thickness, reasonably concentric and free from air blisters, porosity and splits.

NOTE — The purchaser while placing the order, should specify the type of reinforcement required by him.

4.1.4 As required by the purchaser, hose of nominal bore not greater than 38 mm may be mandrel or non-mandrel made; hose of nominal bore above 38 mm shall be mandrel made. The finish may be smooth, fluted or fabric marked.

4.2 Dimensions and Tolerances

4.2.1 *Bore Size* — The bore size when measured according to the method prescribed in **4.2.1.2** of IS : 443-1975‡, shall be as given in Table 1. Other sizes within this range may be supplied by agreement between the purchaser and the supplier. The tolerance shall be those of the previous smaller size.

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*1 MPa = 1 MN/m^2 = 10·2 kgf/cm^2.

†Glossary of terms used in the rubber industry.

‡Methods of sampling and test for rubber hoses (*second revision*).

4.2.2 *Lining and Cover Thickness* — The thickness of the lining and cover of the hose, when measured according to the method prescribed in **4.2.2** of IS : 443-1975*, shall not be less than that specified in Table 1.

TABLE 1 BORE SIZES, TOLERANCES AND MINIMUM THICKNESS OF LINING AND COVER

Sl No.	Nominal Bore	Tolerance on Nominal Bore Size	Minimum Thickness of Lining	Minimum Thickness of Cover		
				Type 1	Type 2	Type 3
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	mm	mm	mm	mm	mm	mm
i)	5·00	± 0·75	1·5	1·00	1·00	1·00
ii)	6·30	± 0·75	1·5	1·00	1·00	1·00
iii)	8·00	± 0·75	1·5	1·00	1·00	1·00
iv)	10·00	± 0·75	1·5	1·00	1·00	1·00
v)	12·50	± 0·75	1·5	1·00	1·00	1·00
vi)	16·00	± 0·75	1·5	1·00	1·00	1·00
vii)	20·00	± 0·75	1·5	1·00	1·00	1·00
viii)	25·00	± 1·25	2·0	1·00	1·00	2·00
ix)	31·50	± 1·25	2·0	1·00	1·00	2·00
x)	38·00	± 1·50	2·0	1·00	1·00	2·00
xi)	50·00	± 1·50	2·5	1·00	1·50	2·00

Note — In case of fluted hose, the cover thickness shall correspond to the measurement made at a point where the thickness of fluting is included therein and that the depth of flute should not exceed 0·5 mm.

4.2.3 The tolerance on any hose length shall be ±1 percent.

l.3 Physical Requirements

4.3.1 *Tensile Strength and Elongation at Break of Lining and Cover* — The ensile strength and elongation at break of rubber used for lining and over of the hose, when tested in accordance with the method prescribed n **5** of IS : 443-1975*, shall comply with the requirements shown in able 2.

4.3.2 *Accelerated Ageing Test* — After ageing at 70 ± 1°C for a period f 72 hours, in accordance with the method prescribed in **6** of IS : 443-1975*, the rubber used for lining of all types of hoses shall not vary by more than ±25 percent for tensile strength and +10, −30 percent for elongation at break of the corresponding values obtained before ageing.

---

*Methods of sampling and test for rubber hoses (*second revision*).

TABLE 2 TENSILE STRENGTH AND ELONGATION AT BREAK OF LINING AND COVER

(*Clause* 4.3.1)

SL No.	HOSE TYPE	TENSILE STRENGTH *Min*	ELONGATION AT BREAK *Min*
(1)	(2)	(3)	(4)
		MPa	percent
1	Lining	4·0	200
	Cover	4·0	200
2	Lining	5·0	250
	Cover	7·0	250
3	Lining	7·0	250
	Cover	10·0	300

4.3.3 *Oil Absorption Test* (*for Type 3 Hose only*). — The increase in mass of a test piece 25 × 25 mm of lining after immersion in oil (conforming to IS : 1628-1986*) at ambient temperature for 72 hours shall not exceed 15 percent of the original mass.

4.4 Performance Requirements

4.4.1 *Adhesion* — When tested in accordance with the method prescribed in **7** of IS : 3400 (Part 5)-1983†, the minimum adhesion value between the lining and reinforcement, between layers and between cover and reinforcement, shall not be less than 1·5 kN/m for Types 1 and 2 and 2 kN/m for Type 3.

4.4.2 *Pressure Requirements* — When tested in accordance with the method prescribed in **8** of IS : 443-1975‡, the hose shall comply with the requirements given in Table 3, and shall show no leakage, porosity or rupture.

5. MARKING

5.1 Each length of hose shall bear the following information,

a) Manufacturer's name or trade-mark,
b) Number of this Indian Standard,
c) Hose type,
d) Nominal bore size,
e) Design working pressure, and
f) Quarter and year of manufacture.

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*Specification for axle oil (*second revision*).

†Methods of test for vulcanized rubbers: Part 5 Adhesion of rubbers to textile fabrics (*second revision*).

‡Methods of sampling and test for rubber hoses (*second revision*).

TABLE 3 PRESSURE REQUIREMENTS

(*Clause* 4.4.2)

Sl No. (1)	Type (2)	Proof Pressure (3) MPa*	Change in Diameter at Proof Pressure (4) percent	Change in Length at Proof Pressure (5) percent	Minimum Bursting Pressure (6) MPa*
i)	1	1·4	± 7	± 7	2·8
ii)	2	2·0	± 7	± 7	4·0
iii)	3	2·8	± 7	± 7	5·6

*MPa = 10·2 kgf/cm^2.

5.1.1 For long length, moulded type of hose, the above markings shall be made at intervals of approximately 10 m.

5.1.2 Each length of hose may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SAMPLING AND CRITERIA FOR CONFORMITY

6.1 For the purpose of ascertaining the conformity of the hose in a consignment to this specification, the scale of sampling and criteria for conformity shall be as prescribed in 3 of IS : 443-1975*.

7. TESTS

7.1 Unless otherwise agreed to between the purchaser and the supplier, all tests shall be carried out within three months from the date of receipt of the material by the purchaser.

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*Methods of sampling and test for rubber hoses (*second revision*).

(*Continued from page* 2)

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